

BLOOD CANCERS & EXERCISE

PROFESSIONAL

WHAT IS BLOOD CANCER?

Blood cancer is a term that refers to cancers affecting the blood, bone marrow, and lymphatic system. They occur when abnormal blood cells start growing out of control in the bone marrow, interrupting the function of normal blood cells. The main types of blood cancers are lymphoma, leukaemia, myeloma, myelodysplastic syndromes and myeloproliferative diseases.

More than one million cases of blood cancer were diagnosed worldwide in 2018, equating to 7% of all cancers (excluding non-melanoma skin cancer) [1]. Approximately 15,000 people are diagnosed with blood cancer in Australia every year [2]. It is the third biggest cause of cancer death across Australia, claiming more lives each year than breast or skin cancer [3].

WHY IS EXERCISE IMPORTANT FOR BLOOD CANCER?

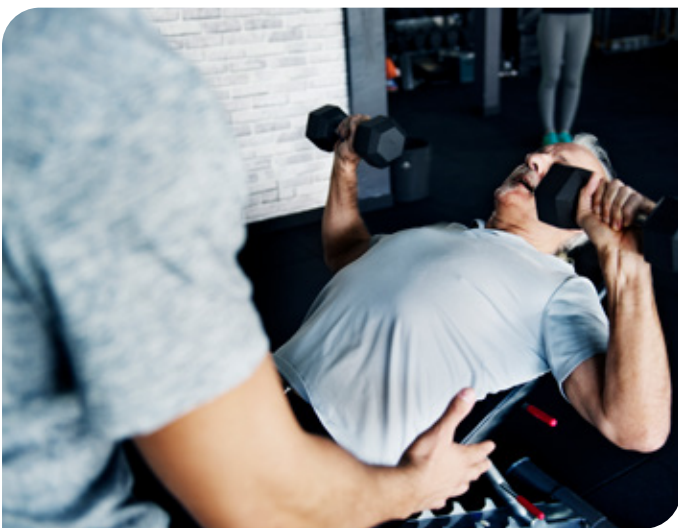
Collectively, blood cancer and its treatment-related side effects reduce quality of life. Common side effects of blood cancer, such as severe anaemia and thrombocytopenia, induce high levels of fatigue. To counter this fatigue, patients have often been recommended to rest and refrain from physical activity, which can lead to a worsening of fatigue and physical function.

Treatment for blood cancers often involves high doses of corticosteroids and long periods of bed-rest, particularly during stem cell transplantation. The subsequent detrimental effects on muscle quality and quantity, and exercise capacity lead to physical deconditioning, frailty and eventual progression to varying degrees of disability.

In blood cancers, exercise training can improve cancer-related fatigue, depressive symptoms, physical function and health-related quality of life, with mixed effects on anxiety [4, 5]. However, there is limited evidence demonstrating greater levels of physical activity reduce the risk of blood cancer, or reduce risk of cancer-specific and all-cause mortality [6].

Exercise has demonstrated many important benefits in non-blood cancer populations, which may also benefit people with blood cancer, such as:

- Increasing cardiorespiratory fitness, muscle strength and endurance
- Improving balance and reducing falls risk;
- Improving bone health;
- Improving cognitive function;
- Helping to maintain a healthy weight, improve self-confidence and body image;
- Reducing the risk of developing chronic diseases such as diabetes, cardiovascular disease and dementia.



IS EXERCISE SAFE FOR PEOPLE WITH BLOOD CANCER?

Supervised aerobic and progressive resistance training appears safe for people with blood cancer [5, 7]. However, many people with blood cancer have associated conditions that increase the risk of an adverse event. Therefore, exercise programs should be written and delivered by a Physiotherapist or an Accredited Exercise Physiologist cognisant of the exercise needs of people with blood cancer and its associated complications.

WHAT TYPE OF EXERCISE IS BEST?

Prior to treatment the focus of exercise training should be on efficiently maximising physical function, which can be difficult due to time constraints between diagnosis and the commencement of therapy e.g. hematopoietic stem cell transplantation.

During treatment such as chemotherapy, radiation therapy and stem cell transplantation, maintaining physical activity can be challenging due to side effects such as nausea, immunosuppression, pain, fatigue and emotional hardship. Adjusting exercise prescription within and between treatment cycles to cater to the disease- and treatment-related side effects will help with exercise adherence.

Following treatment, exercise training provides an opportunity to address functional deficits and return to pre-treatment or better physical fitness.

People with blood cancer are recommended to progress towards and, once achieved, maintain participation in:

- at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic exercise (e.g. walking, jogging, cycling, swimming) each week; and
- two to three resistance exercise (i.e. lifting weights) sessions each week involving moderate-to vigorous-intensity exercises targeting the major muscle groups

WHAT IS A TYPICAL EXERCISE SESSION?

A baseline health assessment should be conducted prior to exercise, including assessing oxygen saturation, heart rate, blood pressure and potential contraindications to exercise. Sessions should begin with 5-10 minutes of progressive aerobic exercise, with extended warm-ups for participants on medications that induce postural hypotension (e.g. Velcade). The main phase should comprise aerobic exercise, such as walking, jogging, cycling or swimming. People with blood cancer often have low baseline fitness due to the disease or its associated treatments, so the program should be tailored to the individual, which may include beginning slowly and progress gradually. The main phase should also include resistance exercises targeting the major muscle groups. Appropriate rest periods should be prescribed depending on fitness levels. Additional balance exercises and stretching activities should be prescribed, especially where deficits are identified. The session should conclude with a 5-10 minute cool-down.



CONTRAINDICATIONS TO EXERCISE

Some people with blood cancer have bone lesions that increase the risk of fracture. If the patient has bone lesions, consult an appropriately qualified exercise professional (Accredited Exercise Physiologist or Physiotherapist) to reduce their risk of falls and fractures. These exercise professionals will consider the location, size and spread of the bone lesions and prescribe appropriate activities to strengthen their muscles and improve their balance whilst avoiding high impact, flexing and twisting movements in the areas of the bone lesions.

If the patient has thrombocytopenia (platelet count $<20 \times 10^9/L$), they will have a higher risk of bleeding. In this case, it is recommended that they choose exercises that are low impact and have a low falls risk. When exercising, we encourage them to breath normally (i.e. avoid breath holding) and closely monitor their body for any bruising and bleeding.

People with blood cancer often experience moderate-to-severe levels of fatigue from the disease, its treatments and side effects, such as severe anaemia. If the patient experiences high levels of fatigue or has low haemoglobin ($<80 \text{ g/L}$), they may need to adjust the intensity or duration of exercise to accommodate fatigue or weakness. When exercising, they should be encouraged to monitor signs and symptoms of fatigue and exertion.

If the patient has neutropenia (neutrophils $<1.5 \times 10^9/L$), a low white blood cell count (i.e. $<2.0 \times 10^9/L$), or a fever (oral temperature $>38^\circ\text{C}$), we recommend that they achieve full health before commencing an exercise program. When you confirm it is safe for them to exercise, minimise their risk of infection by cleaning all equipment before use, be vigilant with hand-washing and use of hand sanitiser, avoid group and public exercise and initially exercise at a low-to-moderate intensity.

Peripheral neuropathy, as a sequelae of certain chemotherapy agents, may adversely affect balance. Minimise the risk of falls by utilising seated exercises and other balance aids.

Postural hypotension may be common as a side effect of certain chemotherapy regimens.

HOW DO I HELP MY PATIENTS GET STARTED?

The best type of exercise is the one that people with bone cancer will adhere to. Strategies that improve the exercise self-efficacy of people with blood cancer are encouraged to enhance exercise adherence, including:

- Consulting a Physiotherapist or an Accredited Exercise Physiologist to ensure their exercise plan is tailored to their abilities, disease- and treatment-related adverse effects, anticipated disease trajectory and health status.
- Choosing activities they enjoy.
- Exercising with a partner, a peer-supporter or in a group to develop a social support network



Something is better than nothing so starting slow, even just a few minutes a day, and progressing slowly will be beneficial. Furthermore, simple activities such as taking the stairs or walking even a little further than usual can help improve their overall health.

RELATED INFORMATION AND REFERENCES

Exercise is Medicine Australia www.exerciseismedicine.org.au

Exercise Right www.exerciseright.com.au

Find a Physiotherapist www.choose.physio

Find an Accredited Exercise Physiologist www.essa.org.au

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If you have any concerns about the safety of your patient in commencing an exercise program, please consider referral to a Sport and Exercise Physician.

Find a Sport and Exercise Physician www.acsep.org.au/

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4. Campbell, K.L., et al., Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. *Med Sci Sports Exerc*, 2019. 51(11): p. 2375-2390.
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